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**NORTH ATLANTIC TREATY ORGANIZATION
ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD**

**MILITARY AGENCY FOR STANDARDIZATION (MAS)
BUREAU MILITAIRE DE STANDARDISATION (BMS)
1110 BRUSSELS**

NATO UNCLASSIFIED

**MAS/225-MMS/4234
7 July 1992**

To : See MAS Distribution List No. 2

Subject : **STANAG 4234 MMS (EDITION 1) - ELECTROMAGNETIC RADIATION
(RADIO FREQUENCY) - 200 kHz TO 40 GHz ENVIRONMENT -
AFFECTING THE DESIGN OF MATERIEL FOR USE BY NATO FORCES**

Reference : AC/310-D/61 dated 10 March 1982

Enclosure : STANAG 4234 (Edition 1)

1 The enclosed NATO Standardization Agreement which has been ratified by nations as reflected in page iii is promulgated herewith.

2. The reference listed above is to be destroyed in accordance with local document destruction procedures.

3 AAP-4 should be amended to reflect the latest status of the STANAG

ACTION BY NATIONAL STAFFS

4. National staffs are requested to examine page iii of the STANAG and if they have not already done so, to advise the Defence Support Division, IS, through their national delegation as appropriate of their intention regarding its ratification and implementation.

DISTRIBUTION STATEMENT C

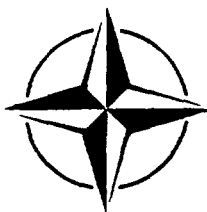
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**E STAI
Major-General, NOAF
Chairman, MAS**

STANAG 4234
(Edition 1)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



MILITARY AGENCY FOR STANDARDIZATION
(MAS)


STANDARDIZATION AGREEMENT

SUBJECT ELECTROMAGNETIC RADIATION (RADIO FREQUENCY) - 200 kHz TO
40 GHz ENVIRONMENT - AFFECTING THE DESIGN OF MATERIEL
FOR USE BY NATO FORCES

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Promulgated on 7 July 1992


E. STAI
Major-General, NOAF
Chairman, MAS

RECORD OF AMENDMENTS

No.	Reference/date of amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Chairman MAS under the authority vested in him by the NATO Military Committee.

2. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

DEFINITIONS

4. Ratification is "The declaration by which a nation formally accepts the content of this Standardization Agreement".

5. Implementation is "The fulfilment by a nation of its obligations under this Standardization Agreement".

6. Reservation is "The stated qualification by a nation which describes that part of this Standardization Agreement which it cannot implement or can implement only with limitations".

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

7. Page iii gives the details of ratification and implementation of this agreement. If no details are shown it signifies that the nation has not yet notified the tasking authority of its intentions. Page iv (and subsequent) gives details of reservations and proprietary rights that have been stated.

Agreed English/French Texts

STANAG 4234
(Edition 1)

NAVY/ARMY/AIR

NATO STANDARDIZATION AGREEMENT
(STANAG)

ELECTROMAGNETIC RADIATION (RADIO FREQUENCY) - 200 kHz to 40 GHz
ENVIRONMENT - AFFECTING THE DESIGN OF MATERIEL FOR USE BY NATO FORCES

Annexes: A. Definitions

B. Electromagnetic Radiation (Radio Frequency) - 200 kHz to
40 GHz Environment

C. Data Sources

Related documents: AC/258-D/258 - Manual on NATO Safety Principles for the
Storage of Ammunition and Explosives

STANAG 1307 - Maximum NATO Naval Operational
Electromagnetic Environment Produced by Radio
and Radar

AIM

1. The aim of this agreement is to define the level of electromagnetic radiation (radio frequency) environment likely to be encountered during NATO operations by all materiel and particularly by all munitions and weapon systems containing electro-explosive devices (EED) and to specify the levels of electro-magnetic radiation (radio frequency) environment to be used as design criteria for all new munitions and weapon systems intended for use by NATO Forces.

2. The electromagnetic radiation (radio frequency) environment defined in this agreement is not intended to replace that environment associated with the fundamental requirement that all munitions and weapon systems containing EED shall be designed to remain safe and reliable in:

- (a) the electromagnetic radiation (radio frequency) environment produced by the munition or weapon system itself;
- (b) the specified, electromagnetic radiation (radio frequency) scenario, (including that produced by the weapon platform i.e. the ship, vehicle or aircraft) in which the munition or weapon system is required to be stored, handled and operated.

STANAG 4234
(Edition 1)

-2-

AGREEMENT

3. Participating nations agree:

- (a) that the electromagnetic radiation (radio frequency) environment defined in Annex B is a level likely to be encountered by munitions and weapon systems containing EED during storage and transportation and at any stage in the sequence of use from stockpile to the instant the specified safe separation distance is achieved;
- (b) to specify the electromagnetic radiation (radio frequency) environment defined in Annex B as:
 - (1) minimum design criteria for all new munitions and weapon systems configured as intended for storage and transportation by NATO Forces;
 - (2) the minimum design aim/objective for all new munitions and weapon systems intended for deployment or use in the operational role/configuration by NATO Forces.
- (c) that nations developing new munitions and weapon systems for NATO Forces shall, for interoperability purposes, provide information on:
 - (1) the procedure and method used to establish the safety and reliability of EED installed in munitions and weapon systems when exposed to the electromagnetic radiation (radio frequency) environment defined in Annex B, under all configurations of service use;
 - (2) the electromagnetic radiation (radio frequency) environment in which the munition or weapon system has been certified as safe and suitable for deployment in the operational role/configuration.

IMPLEMENTATION OF THE AGREEMENT

4. This STANAG is implemented when a nation has issued the necessary orders/instructions:

- (a) that all future munitions and weapon systems containing EED will be designed in accordance with this agreement;
- (b) to provide other NATO Forces with the information detailed in this agreement.

A-1

ANNEX A to
STANAG 4234
(Edition 1)

DEFINITIONS

The following definitions are used for the purposes of this agreement only:

- (a) ELECTRO-EXPLOSIVE DEVICE (EED) A one shot explosive or pyrotechnic device used as the initiating element in an explosive or mechanical train and which is activated by the application of electrical energy.
- (b) ELECTROMAGNETIC RADIATION (RADIO FREQUENCY) ENVIRONMENT

Electromagnetic radiation from radio frequency sources operating in the frequency band 200 kHz to 40 GHz expressed in RMS electric field strengths (V_m-1) or mean power density levels (W_m-2).

ELECTROMAGNETIC RADIATION (RADIO FREQUENCY) - 200 kHz to 40 GHz ENVIRONMENT

BACKGROUND

1. Electro-explosive devices (EED) are extensively used in modern munitions and weapon systems to initiate explosives and pyrotechnics. They are designed specifically to function as a result of heating of some part of the initiating material by an input of electrical energy.

2. Any length of wire such as may form all or part of the firing circuits to an EED, when immersed in an electromagnetic (radio frequency) field, will pick up some electrical energy from the field. The level of pick-up is dependent upon the physical and electrical parameters of the wire used relative to the wavelength of the transmission, its orientation with respect to the transmitter aerial and the intensity of the field at the position of pick-up.

3. The amount of energy fed to a connected EED will depend mainly upon the electrical impedance of the firing circuit relative to the EED but sufficient energy to initiate certain types of EED can be picked up at substantially lower field strengths than those likely to be encountered during NATO operations.

ELECTROMAGNETIC RADIATION (RADIO FREQUENCY) ENVIRONMENT - SPECIFICATION

4. The electromagnetic radiation (radio frequency) environment likely to be encountered by munitions and weapon systems at any stage in the sequence of use from stockpile to the instant the specified safe separation distance is achieved, is given in Table 1. It should be noted however that electromagnetic (radio frequency) field strengths in excess of the levels given in Table 1 can be produced by a limited number of high powered transmitters and that additional precautions or protective measures may need to be observed if munitions and weapon systems designed to meet the criteria defined in this agreement, are required to be used in the vicinity of the aerial systems of such transmitters.

ANNEX B to
STANAG 4234
(Edition 1)

B-2

TABLE 1
ELECTROMAGNETIC RADIATION (RADIO FREQUENCY) ENVIRONMENT

Frequency	RMS Electric Field Strength	Mean Power Density
	Vm-1	Wm-2
a. <u>COMMUNICATIONS TRANSMISSION</u>		
200 kHz - 525 kHz	300	
525 kHz - 32 MHz	200	
32 MHz - 1000 MHz	-	10
b. <u>RADAR AND CW TRANSMISSIONS</u>		
150 MHz - 225 MHz		100
225 MHz - 790 MHz		50
790 MHz - 18 GHz		1000
18 GHz - 40 GHz		100

C-1

ANNEX C to
STANAG 4234

DATA SOURCES

BELGIUM

CANADA

DENMARK

FRANCE

SPECIFICATION GENERALE - INTER DRAM

GERMANY

VG 95378

VG 95379

UNITED KINGDOM

DEF STAN 59-41

DEF STAN 08-3

NAVAL WEAPON SPECIFICATION NO. 6

UNITED STATES

MIL STANDARD 1385

AFR 127-100

US DOD STD 1463 (AR)

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

N A T I O N	NATIONAL RATIFICATION REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
			FORECAST DATE DATE PREVUE			ACTUAL DATE DATE REELLE		
			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE	GSA 3094 of/du 22.7.87		10.92	10.92	10.92			
CA	Will not ratify/ ne ratifie pas							
DA	M.204.69-S 4234/MAS-18412 of/du 28.7.87	SMK BST 641-11 and STANAG	10.92	10.92	10.92			
FR*	1/15/13.0086/ST/MMP/MIS of/du 18.6.91							
GE	BMVg Fü S IV 1 Az 03-51-60 of/du 22.10.87		11.92	11.92	11.92			
GR								
IT								
LU								
NL	M88/0198/4861 of/du 21.6.88					7.92	7.92	7.92
NO								
PO								
SP								
TU	Gn.P.P.2307-621-87 AND.D. MAS.S(4234)-2810				6.88			
UK*	D/D Stan/341/8/4234 of/du 25.7.89	DEF STAN 00-35 & NES 1006	7.93	7.93	7.93			
US								

*See reservation overleaf/
 Voir réserve au verso

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STANAG 4234
(Edition 1)

iv

RESERVATIONS/RESERVES

FRANCE

- France requests revision of STANAG 4234 here and now:
- to take account of energy and power density levels and peak field levels;
 - to show "severe" and "normal" environments in the STANAG;
 - to extend the range of frequencies covered by the STANAG (150 kHz instead of 200 kHz).

La France demande qu'une révision du STANAG 4234 soit entreprise dès à présent :

- pour la prise en compte des niveaux de densité de puissance et d'énergie ainsi que des niveaux de champs de crête;
- afin de faire apparaître dans le STANAG des environnements "sévère" et "normal";
- pour l'extension de la gamme de fréquences couvertes par le STANAG (150 kHz au lieu de 200 kHz).

UNITED KINGDOM
ROYAUME-UNI

- (1) Annex B, Table 1 - The UK will interpret this table by taking the higher of the stated mean power densities, where two are given for the same frequency band, to be the minimum rf environment that could be encountered by NATO Forces.
 - (2) Annex B, Table 1 - The UK will interpret this table as applying to power-sensitive electro-explosive devices. Energy-sensitive devices need special consideration in that they can be functioned by pick-up from a single pulse of rf energy.
-
- (1) Annexe B, tableau 1 - Le Royaume-Uni interprétera ce tableau en prenant la plus forte des densités de puissance moyennes là où il y en a deux pour la même bande de fréquence, en considérant qu'il s'agit de l'environnement de radiofréquence minimum que peuvent rencontrer les forces de l'OTAN.
 - (2) Annexe B, tableau 1 - Le Royaume-Uni interprétera ce tableau comme s'appliquant aux dispositifs électro-pyrotechniques sensibles à l'apport d'énergie. Les dispositifs sensibles à l'énergie doivent être pris spécialement en considération en ce sens qu'ils peuvent être déclenchés par une seule impulsion d'énergie rf.

Amendment 1

iv

NATO SANS CLASSIFICATION